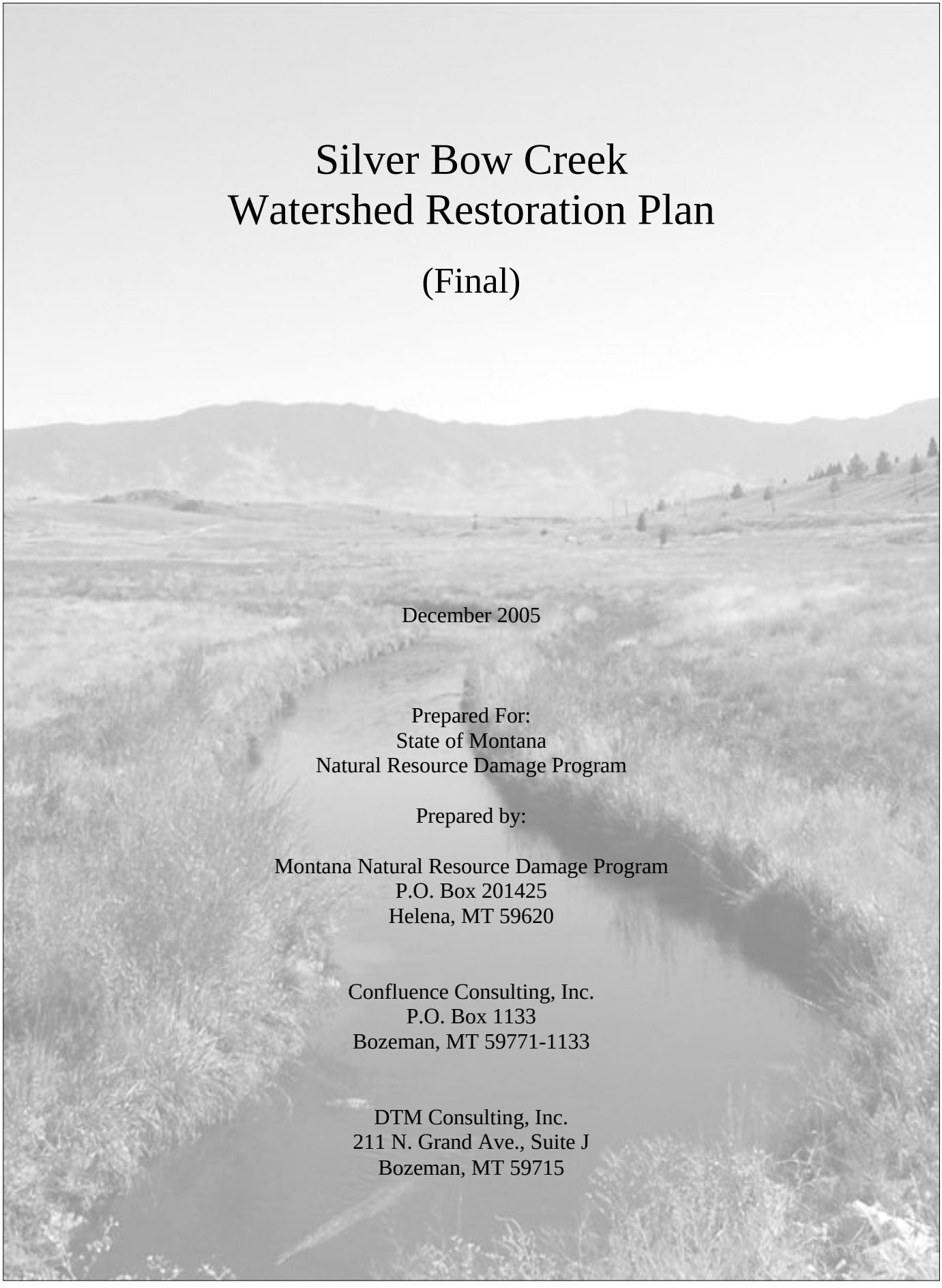

Silver Bow Creek
Watershed Restoration Plan

(Final)

December 2005

Prepared For:
State of Montana
Natural Resource Damage Program

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Abbreviation List

ARCO – The Atlantic Richfield Company
BPSOU – Butte Priority Soils Operable Unit
CECRA – The Comprehensive Environmental Cleanup and Responsibility Act
CERCLA – Comprehensive Environmental Compensation and Liability Act
CFS – cubic feet per second
DEQ – Department of Environmental Quality
DNRC – Department of Natural Resources and Conservation
EPA – Environmental Protection Agency
EQIP – Environmental Quality Incentives Program
FWP – Fish, Wildlife, & Parks
GAP – Gap Analysis Program
GIS – Geographic Information System
GWIC – Groundwater Information Center
GLO – Government Land Office
MBMG – Montana Bureau of Mines and Geology
MPDES – Montana Pollution Discharge Elimination System
Mg/L – milligram per liter
µg/L – microgram per liter
NLCD – USGS National Land Cover Database
NPL – National Priority List
NRD – Natural Resource Damage
NRDP – Natural Resource Damage Program
NRIS – Natural Resource Information System
NWI – National Wetlands Inventory
OHV – Off highway vehicle
OU – Operable Unit
PDG – Project Development Grant
PRP – Potentially Responsible Party
ROD – Record of Decision
RPPC – Restoration Plan Procedures and Criteria
SCD/BUD – Sufficient Credible Data/Beneficial Use Determination

SSTOU – Streamside Tailings Operable Unit
TMDL – Total Maximum Daily Load
UCFRB – Upper Clark Fork River Basin
USFS – United States Forest Service
USGS – United States Geological Survey
WCT – Westslope Cutthroat Trout
WMA – Wildlife Management Area
WWTP – Waste Water Treatment Plant

EXECUTIVE SUMMARY

The Silver Bow Creek watershed in southwest Montana encompasses approximately 474 square miles and forms a portion of the headwaters the Clark Fork River and ultimately, the Columbia River. The watershed encompasses parts of Silver Bow and Deer Lodge counties. The eastern boundary of the watershed corresponds to the boundary between Silver Bow and Jefferson counties. The watershed contains both upland forested areas and grass and shrub dominated valley bottoms. The city of Butte (population 33,892 – 2000 Census) is the largest population center and the city of Anaconda (population 9,417) is just outside of the watershed area. The dominant land use has historically been mining, with minor amounts of agriculture and tourism.

Decades of mining activities near Butte and Anaconda resulted in extensive environmental degradation and designation of portions of the watershed as federal Superfund sites. In 1983, the State of Montana filed a natural resource damage lawsuit against ARCO to recover damages for injuries to the water, soils, vegetation, fish and wildlife resources in the Upper Clark Fork River Basin, including along the Silver Bow Creek floodplain corridor. The lawsuit also sought damages for the public's lost use and enjoyment of these resources. As part of the 1999 settlement, the state received $215 million, including about $130 million in natural resource damages to restore or replace the injured resources.

In early 2000, the State finalized the criteria and procedures for spending the $130 million damage award. The State established a grant process whereby government agencies and private entities and individuals are eligible to apply for funds for projects that will restore or improve the injured natural resources and the recreation opportunities that accompany them, including hunting and fishing. The State developed the *Silver Bow Creek Watershed Restoration Plan* as a result of public input indicating the need for watershed-scale restoration planning that would serve as a guide to restoration work in the watershed. This plan provides guidance for prioritizing restoration activities to address injuries caused by mining and mineral processing activities and other issues, and to improve the overall watershed condition. Although disbursement of grant funds drove this watershed restoration plan development, not all restoration needs can be addressed with this funding. The plan identifies all known restoration needs for the watershed regardless of funding restrictions, and identifies potential alternative restoration funding sources.

This plan relies on many watershed restoration concepts and methods applied in other regions and on modern digital spatial technologies for analysis. Public involvement also played a major role in the development of this plan. Stakeholders provided valuable information on restoration issues, needs, and priorities. Most importantly, stakeholders contributed to the development of the following future vision statement that provided guidance throughout the development of this plan:

> *In the 21st century, the Silver Bow Creek Watershed is a vibrant place to live, work and recreate. The watershed is protected from adverse impacts of mining*

contamination. The restored watershed supports viable, self-sustaining communities of fish, wildlife and vegetation, and high-quality water resources. Native species are maintained and restored where practicable. The watershed's healthy ecosystem provides for quality education and balanced recreation, contributing to a diverse and sustainable economy, improved aesthetics, and community well-being. Stable and healthy local communities of informed citizens actively protect the watershed's resources.

Development of this plan required dividing the watershed into eight planning areas to create a manageable spatial framework (Figure ES-1). Seven of the eight planning areas coincide with major tributary sub-watersheds. The exception is the Silver Bow Creek corridor, which warranted a separate planning area. For each area, this plan summarizes information on the conditions of water, fisheries, vegetation, wildlife, and recreational resources and identifies the restoration needs.

This plan identifies 60 significant restoration needs within the eight planning areas. Restoration needs fall into six separate categories listed in order of importance to watershed restoration, with the first two equally important. These categories follow the public vision statement developed for the Silver Bow Creek watershed:

1. preserve and protect existing resources
2. mitigate pollution
3. improve water quantity
4. restore fisheries
5. restore vegetation and wildlife
6. enhance and develop recreational opportunities

A prioritization process that considered the watershed benefits, local (planning area) benefits, and costs to address each of the restoration needs, provided information to develop a ranking of the restoration needs. The importance of the restoration category for each restoration need and the primary and secondary goals provided in the vision statement also contributed to the ranking. Figure ES-2 illustrates the watershed restoration plan development process.

The tables below provide a condensed version of the priorities established through this process. Four of the 60 identified needs were not ranked because they will likely be addressed through ongoing or planned efforts. Of the remaining 56 prioritized needs, 11 ranked very high, 17 ranked high, 17 ranked moderate, and 11 ranked low in restoration importance. The restoration needs with a high or very high restoration importance will be favorable funding prospects for natural resource damage grant funds or other funding sources. Those of moderate importance are likely to derive sufficient benefits to warrant funding consideration for natural resource damage grant funds or other funding sources. Restoration needs with low restoration importance are likely to have insufficient benefit to warrant funding in the near future.

As part of its grants evaluation process established by the *UCFRB Restoration Plan Procedures and Criteria*, the State will consider the consistency of proposed projects in the Silver Bow Creek watershed with the priorities established with this plan. Therefore, prospective applicants for natural resource damage grant funds should utilize this plan to ensure that potential restoration projects address important, identified restoration needs. This plan does not affect the funding evaluation of proposed projects that are within the Upper Clark Fork River Basin but outside of the boundaries of the Silver Bow Creek watershed.

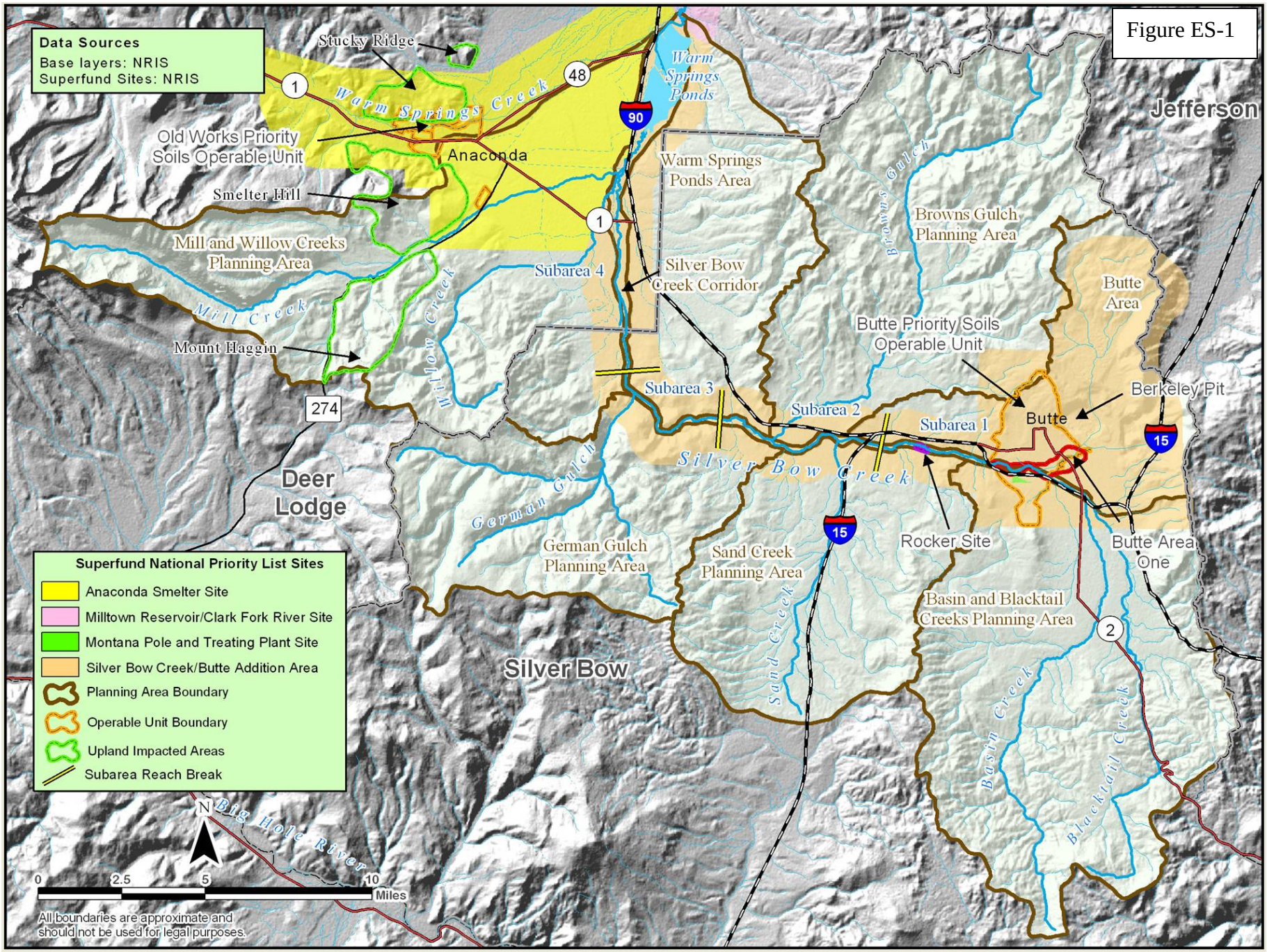
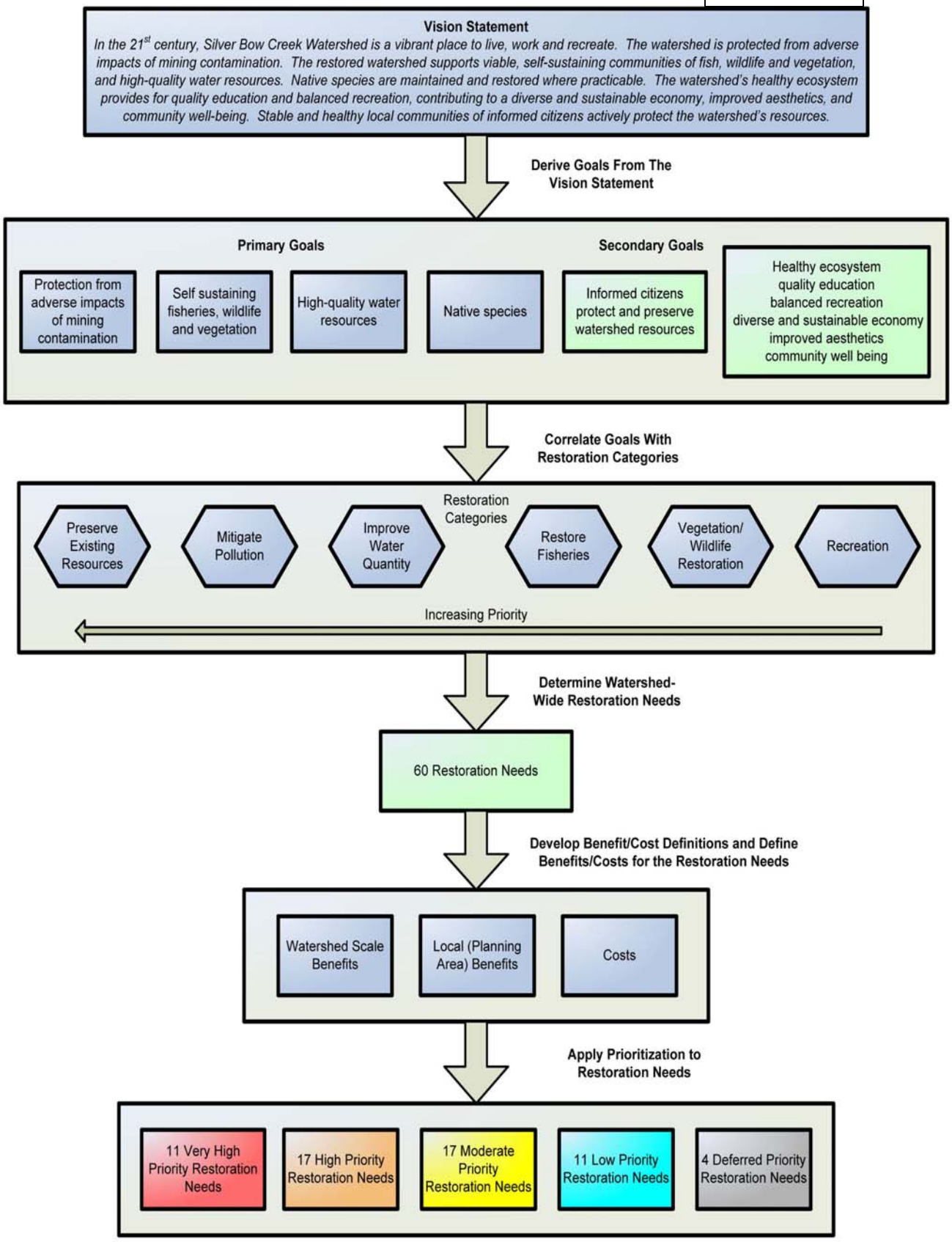


Figure ES-1
Data Sources
Base layers: NRIS
Superfund Sites: NRIS
Stucky Ridge
Warm Springs Creek
Old Works Priority Soils Operable Unit
Anaconda
Smelter Hill
Mill and Willow Creeks Planning Area
Mill Creek
Mount Haggin
Willow Creek
Deer Lodge
Warm Springs Ponds
Warm Springs Ponds Area
Subarea 4
Silver Bow Creek Corridor
Jefferson
Browns Gulch
Browns Gulch Planning Area
Butte Area
Butte Priority Soils Operable Unit
Subarea 3
Subarea 2
Subarea 1
Butte
Berkeley Pit
Silver Bow Creek
German Gulch
German Gulch Planning Area
Sand Creek Planning Area
Rocker Site
Butte Area One
Basin and Blacktail Creeks Planning Area
Sand Creek
Basin Creek
Blacktail Creek
Silver Bow
Big Hole River
Superfund National Priority List Sites
Anaconda Smelter Site
Milltown Reservoir/Clark Fork River Site
Montana Pole and Treating Plant Site
Silver Bow Creek/Butte Addition Area
Planning Area Boundary
Operable Unit Boundary
Upland Impacted Areas
Subarea Reach Break
N
0
2.5
5
10
Miles
All boundaries are approximate and should not be used for legal purposes.

Figure ES-2


Vision Statement
In the 21st century, Silver Bow Creek Watershed is a vibrant place to live, work and recreate. The watershed is protected from adverse impacts of mining contamination. The restored watershed supports viable, self-sustaining communities of fish, wildlife and vegetation, and high-quality water resources. Native species are maintained and restored where practicable. The watershed's healthy ecosystem provides for quality education and balanced recreation, contributing to a diverse and sustainable economy, improved aesthetics, and community well-being. Stable and healthy local communities of informed citizens actively protect the watershed's resources.
Derive Goals From The Vision Statement
Primary Goals
Protection from adverse impacts of mining contamination
Self sustaining fisheries, wildlife and vegetation
High-quality water resources
Native species
Secondary Goals
Informed citizens protect and preserve watershed resources
Healthy ecosystem
quality education
balanced recreation
diverse and sustainable economy
improved aesthetics
community well being
Correlate Goals With Restoration Categories
Restoration Categories
Preserve Existing Resources
Mitigate Pollution
Improve Water Quantity
Restore Fisheries
Vegetation/ Wildlife Restoration
Recreation
Increasing Priority
Determine Watershed-Wide Restoration Needs
60 Restoration Needs
Develop Benefit/Cost Definitions and Define Benefits/Costs for the Restoration Needs
Watershed Scale Benefits
Local (Planning Area) Benefits
Costs
Apply Prioritization to Restoration Needs
11 Very High Priority Restoration Needs
17 High Priority Restoration Needs
17 Moderate Priority Restoration Needs
11 Low Priority Restoration Needs
4 Deferred Priority Restoration Needs

Summary of prioritized restoration needs in the Silver Bow Creek watershed

Rank	*Restoration Importance*	*Planning Area and Issue/Problem*	*Restoration Needs*
1	Very High	**Basin and Blacktail creeks:** Limited drinking water sources for the city of Butte make **Basin Creek** a critical source of water.	Protect Basin Creek from potential pollution sources and activities that may threaten water quality. Mitigate risk of wildfire and potential sediment loading.
2	Very High	**Butte Area:** Limited drinking water supplies for the city of Butte make Moulton Reservoir a critical source of water.	Protect Yankee Doodle Creek from potential pollution sources and activities that may threaten water quality.
3	Very High	**Mill and Willow creeks and Silver Bow Creek corridor:** The future configuration of connections between Mill Creek, Willow Creek, the Mill-Willow Bypass, Silver Bow Creek, the Warm Springs Ponds, and the Clark Fork River is unknown.	Investigation should be conducted as to the ultimate fate and the implications of changing the configuration of the connections between Mill Creek, Willow Creek, the Mill-Willow Bypass, Silver Bow Creek, the Warm Springs Ponds, and the Clark Fork River prior to EPA's determination of a final remedy for the Ponds. See also deferred category #59.
4	Very High	**Basin and Blacktail creeks:** Genetically pure population of native westslope cutthroat trout exist in focal habitat in upper **Basin Creek** and need protection.	Activities to protect the upper Basin Creek water supply will help protect westslope cutthroat trout. Reservoirs form a fish passage barrier to prevent introgression of non-native species. Evaluate adjunct westslope cutthroat trout habitat in other parts of Basin Creek.
5	Very High	**Butte Area and Silver Bow Creek corridor:** Mining related contaminants continue to enter Silver Bow Creek and degrade water quality. Storm water from the Butte area and groundwater in Butte Area One are the primary sources.	Ongoing and future remediation and the outcome of current litigation may address some of these sources of contamination. Seek effective remediation of the Butte Priority Soils Operable Unit. Following the Record of Decision, update the State's restoration plan for Butte Area One. Eliminate or isolate remaining sources of water quality impairment.
6	Very High	**Silver Bow Creek corridor:** Remediation and restoration actions along the Silver Bow Creek floodplain on private lands need to be protected from potentially detrimental land management activities in the long term.	Acquire land or conservation easements along the Silver Bow Creek corridor to protect restored areas. Subarea 2 contains about 320 acres and Subarea 4 contains about 500 acres of private lands that should be considered for acquisition or easements.
7	Very High	**German Gulch:** A significant native westslope cutthroat trout population needs preservation and protection. Chronic competition from brook trout may jeopardize native westslope cutthroat trout populations.	Continue actions by Montana FWP and USFS to suppress brook trout. See deferred need #57 associated with Beal Mine.
8	Very High	**German Gulch:** Much of German Gulch is diverted for irrigation just before reaching Silver Bow Creek. This water could significantly help water quality problems in Silver Bow Creek, especially during low flows.	Explore the best alternative for obtaining adequate flows for connectivity with Silver Bow Creek. Alternatives include water conservation, water leasing, alternative irrigation source, or acquisition. In 2005 the State approved funding of a project to provide for fish passage and this connectivity.

Rank	*Restoration Importance*	*Planning Area and Issue/Problem*	*Restoration Needs*
9	Very High	**Browns Gulch:** Current conditions of fisheries are not well understood.	Conduct additional fisheries assessment in the upper and lower reaches of Browns Gulch and major tributaries. In 2004 the State approved funding for such assessment work.
10	Very High	**Silver Bow Creek corridor:** Recreational opportunities are minimal due to historic mining impacts.	Implement a greenway trail system along the entire length of Silver Bow Creek. Acquire/develop access for fishing and water recreation. Create a series of trails connecting to nearby communities (Anaconda and Butte). These needs reflected in the 1998 Silver Bow Creek Greenway design document. Public land managers believe this trail should be low impact where it bisects important wildlife habitat and should allow foot, bicycle, or horse access only.
11	Very High	**Butte Area:** Additional connecting trails between the Greenway and urban residential areas are desired.	Develop additional connecting trails.
12	High	**Mill and Willow creeks:** Critical wildlife winter range exists along the public land/private land boundary and could be developed.	Protect these critical lands from potentially detrimental development through land acquisition and conservation easements.
13	High	**Mill and Willow creeks:** Dewatering for irrigation impairs fisheries and exacerbates water quality problems.	Increase instream flow during critical life stages of fish through water leasing, conservation and other measures.
14	High	**Browns Gulch:** Stream flow is inadequate for fisheries in the lower reaches of Browns Gulch. Lack of flow is the greatest limiting factor to fishery improvements.	Identify and implement means to augment stream flow. Water conservation and water leasing are possibilities. In 2004 the State approved funding for a project to conduct needed flow studies.
15	High	**Silver Bow Creek corridor:** Remedial actions will fall short of creating an optimal fishery.	Enhance fish habitat diversity and structural complexity; improve substrate in future reaches where appropriate. Approved Greenway funding will address this need in Reaches A - I. Coordinate with installation of migration barriers as needed to promote native fishery.
16	High	**Basin and Blacktail creeks:** Genetically pure westslope cutthroat are likely present in upper Blacktail Creek.	Evaluate focal and adjunct westslope cutthroat trout habitat in Blacktail Creek. Take appropriate measures to improve/protect these habitats.
17	High	**Butte Area:** The Westside Soils Operable Unit area currently has a high level of recreational use but has impacts from this use and hazards associated with historic mining activity, such as abandoned mine dumps.	EPA decisions on the needed remediation, if any, of the Westside Soils Operable Unit has been deferred until the Agency is funded to address this area. Restoration planning should be deferred until completion of a final remedy decision. ARCO owns the majority of lands and seeks a recreational land use scenario. Anticipated recreational needs are likely to be limited to trails for dispersed recreation.

Rank	*Restoration Importance*	*Planning Area and Issue/Problem*	*Restoration Needs*
18	High	**Butte Area:** The upper reaches of Silver Bow Creek were obliterated by historic mining activities. A replacement surface water feature is desired.	Create a surface water feature with adjacent parkland and trails along the upper reaches of Silver Bow Creek between Texas Ave and the Blacktail Creek confluence. Plans are under way to accomplish this using water from the Silver Lake water system. Treated Berkeley Pit water is also a possible future water source if this treated water is not needed for mining operations. Current mining operations consume all of the current output of the Horseshoe Bend treatment plant.
19	High	**Butte Area:** Butte area residents have not had access to a variety of recreational features as a result of mining activities and contamination.	Develop a variety of recreational features such as parks, open spaces, swimming areas and trails that are readily accessible for citizens of all ages. Benefits will vary based on number and magnitude of these features; cost assumes 3 of these features.
20	High	**Basin and Blacktail creeks:** Thompson Park recreation facilities are in need of upgrade or repair. A consistent funding source is needed to maintain these facilities.	Obtain funding for renovation and maintenance of facilities. Undertake renovation activities.
21	High	**Mill and Willow creeks:** Storm water runoff from smelter fallout contaminated hillslopes continues to deliver metals to Mill Creek and to a lesser extent, Willow Creek.	The outcome of pending remedial action/remedial design and litigation may address part of this issue. The State's restoration claim and plan cover the needed actions.
22	High	**German Gulch:** Private lands along lower German Gulch adjacent to the Fleecer Mountain and Mt. Haggin Wildlife Management Areas are at risk for potentially detrimental development. These lands are part of the elk and deer winter range in this area.	Protect these critical lands from potentially detrimental development through land acquisition and conservation easements.
23	High	**Browns Gulch:** Establish focal habitat for westslope cutthroat trout.	Assess feasibility of and establish isolated westslope cutthroat trout habitat in headwater areas, particularly in Alaska Gulch, via fish passage barriers and limited habitat improvement.
24	High	**Silver Bow Creek corridor:** Remedial actions will fall short of restoring a healthy riparian vegetation zone along Silver Bow Creek and its floodplain. Wildlife populations are limited in the corridor.	Enhance riparian vegetation. Wetlands creation may be appropriate locally and will have a beneficial impact on water quality. Establishment of a healthy riparian zone along Silver Bow Creek will create the opportunity for wildlife to reoccupy this area. Approved Greenway funding will address Reaches A-I and P-R..
25	High	**Butte Area:** Contaminated soils and lack of fresh water supplies have prevented vegetation from surviving and thriving in the Butte area. Entryway corridors and open spaces are in need of "greening."	Identify limiting factors to vegetation survival and address these issues. Develop alternative water sources that will enable vegetation to survive. One option is to utilize water that flows from upper Silver Bow Creek and Yankee Doodle Creek into the Yankee Doodle tailings impoundment. Use of this water is limited by current mining operations. Plant metals-tolerant trees, shrubs, and grasses (preferably native species) along entryway corridors and open spaces.

Rank	*Restoration Importance*	*Planning Area and Issue/Problem*	*Restoration Needs*
26	High	**Mill and Willow creeks:** Smelter emissions have caused widespread contamination of soils with metals and arsenic in upland areas around Anaconda, degrading vegetation and wildlife habitat.	The outcome of current remediation and litigation is anticipated to address this problem. Restoration of the upland areas is addressed in the State's 2002 restoration plan.
27	High	**German Gulch:** Public input indicates a desire for trail access from Silver Bow Creek.	Examine feasibility and appropriateness of a trail from Silver Bow Creek to German Gulch. In 2005 the State approved funding for a footbridge and 2 mile trail in lower German Gulch.
28	High	**Butte Area:** Nearby recreational fishing opportunities are not available to local residents.	Develop recreational (stream and/or pond) fishing opportunities in the Butte area. One such opportunity in Butte is currently being considered.
29	Moderate	**Mill and Willow creeks:** The Yellow Ditch, the Blue Lagoon, and railroad and road crossings over streams are all sources of metals contamination to Mill and Willow creeks.	Ongoing remediation and the outcome of current litigation may address some of these sources of contamination. Identify, assess, and restore those not the subject of these efforts.
30	Moderate	**Browns Gulch:** Water quality (siltation, nutrients, temperature) may be impaired.	Address water quality impairments via improvement in land use practices.
31	Moderate	**Silver Bow Creek corridor:** Nutrients are discharged to Silver Bow Creek from the Butte and Rocker wastewater treatment facilities.	Improve/upgrade treatment of municipal effluent. Proportionately, the Butte wastewater treatment plant contributes far greater amounts of nutrient loading to Silver Bow Creek than the Rocker wastewater treatment plant. Butte-Silver Bow has obligations to further reduce its nutrient discharge by 2007 via the Clark Fork River voluntary nutrient reduction program.
32	Moderate	**Basin and Blacktail creeks:** Riparian degradation and channelization along **Blacktail Creek** were detected in the aerial photography assessment.	Improve aquatic habitat and riparian vegetation along Blacktail Creek, primarily in the valley foothill sections. A field assessment is needed first to assess degraded conditions and potential solutions.
33	Moderate	**German Gulch:** Noxious weed infestations are present and associated with historic placer mining disturbance, grazing, modern mining, and roads.	Take actions to reduce spread of noxious weeds. (See #34 regarding grazing.)
34	Moderate	**German Gulch:** Livestock grazing has reportedly had a detrimental impact on stream habitat.	Examine grazing practices and implement appropriate grazing management strategies to minimize impacts.
35	Moderate	**Basin and Blacktail creeks:** High density of septic systems south of Butte may be contributing nutrients to ground and surface water.	Evaluate the impact of septic systems. Take appropriate actions such as expansion of Butte wastewater treatment facility to incorporate some residential areas currently on septic systems.
36	Moderate	**Browns Gulch:** Improve fisheries habitat in lower reaches of Browns Gulch. Connecting a lower Browns Gulch fishery to a future Silver Bow Creek fishery is desired.	Assess feasibility of adequately addressing limiting factors to fisheries of water quantity, water quality, and habitat issues. Subsequent to addressing the water quantity and quality problems that limit fisheries in Brown's Gulch, improve aquatic habitat to further improve fishery populations.

Rank	*Restoration Importance*	*Planning Area and Issue/Problem*	*Restoration Needs*
37	Moderate	**Mill and Willow creeks:** Livestock grazing degrades riparian vegetation and causes bank erosion.	Restore healthy riparian zones through better grazing management and re-vegetation. Stream restoration measures may be necessary locally. See also deferred restoration need #60.
38	Moderate	**German Gulch:** Off-highway vehicle use in the area has caused disturbances.	Examine restrictions on motorized access.
39	Moderate	**Basin and Blacktail creeks:** Recreational fisheries along the valley foothill portions of **Basin and Blacktail creeks** are marginal.	Subsequent to or concurrent with needed fishery improvements (#30), improve recreational fishing access opportunities via trail access and fishing access sites.
40	Moderate	**Browns Gulch:** Better public access is desired.	Identify and pursue public access opportunities in cooperation with current landowners.
41	Moderate	**German Gulch:** Riparian lands (old placer mining claims within the USFS land) along German Gulch are at risk for potentially detrimental development. Already, historic access to private lands in this area has been lost after change in ownership.	Acquire lands or conservation easements to protect these areas from potentially detrimental development. In 2005 the State approved funding for public acquisition of 82 acres of riparian corridor in lower German Gulch.
42	Moderate	**Basin and Blacktail creeks:** The historic Highland Mine may be a source of metals contamination in the headwaters of **Basin Creek**.	Additional water quality and site sampling is necessary; water quality sampling from the 1970s is suspect. Contamination problems, if any, are predicted to be minor given the site's location and small area of disturbance.
43	Moderate	**Basin and Blacktail creeks:** Limited 1970s water quality sampling on the valley foothill portion of **Basin Creek** (downstream of municipal source water area) indicates metals contamination.	Re-sample Basin Creek water quality. Evaluate railroad bed as a possible source. Mitigate pollution source(s) if water quality impairment is confirmed.
44	Moderate	**German Gulch:** Historic placer mining has disturbed both aquatic and riparian habitat.	Restore stream and riparian habitat where habitat has not recovered from placer mining. In 2005 the State approved funding of a stream restoration demonstration project in placer-impacted areas of lower German Gulch.
45	Moderate	**Mill and Willow creeks:** Public access is lacking.	Seek recreational access through easements, acquisitions, or access programs.
46	Low	**Mill and Willow creeks:** Mining related contaminants are present in groundwater underneath the Opportunity Ponds. These contaminants may eventually reach Mill Creek, the Mill-Willow Bypass, and Silver Bow Creek.	Metal contamination from this source should be minimized to limit impact to these streams. Current amounts of contaminants (metals) from this source reaching Mill Creek, the Mill-Willow Bypass, and Silver Bow Creek are believed to be low. Identified contaminant plumes of cadmium, lead, zinc, and arsenic are believed to be slow moving. Secondary contaminants iron, manganese, and sulfate are faster moving and at higher levels, but do not present significant environmental impacts.
47	Low	**Mill and Willow creeks:** Nuisance algae is observed in both Mill and Willow creeks. Sources and impacts to fisheries are unknown.	Investigate potential sources and impacts. Reduce nutrient loading as determined necessary from studies.

Rank	*Restoration Importance*	*Planning Area and Issue/Problem*	*Restoration Needs*
48	Low	**Mill and Willow creeks:** Excessive siltation is reported in both Mill and Willow creeks. Reduced vegetative cover resulting from smelter impacts exacerbates erosion. Other known sources are timber harvest in the upper reaches of Willow Creek, road and railroad crossings, and cattle grazing.	Via remediation and restoration activities in the Anaconda Uplands, vegetation cover will be increased (refer to restoration need #26). Address other known sources of siltation through implementing better timber harvest and grazing management and restoration measures where appropriate.
49	Low	**Sand Creek:** Fisheries data in the headwater tributaries is lacking. Small headwater tributaries in the southwest portion of the sub-watershed may host isolated populations of native fish.	Investigate the presence of fisheries and nature of these streams for stocking potential and protection/restoration needs.
50	Low	**Basin and Blacktail creeks:** Riparian degradation and channelization along **Basin Creek** was detected in the aerial photography assessment. Riparian vegetation along Basin Creek below the reservoirs is sparse and lacks diversity.	Improve aquatic habitat and riparian vegetation along Basin Creek, primarily in the valley foothill sections. A field assessment is needed first to assess degraded conditions and potential solutions.
51	Low	**Sand Creek:** Land development is threatening open space and wildlife habitat in the higher elevation areas of the sub-watershed.	Acquire land or conservation easements along the private/public land boundary in the southwest portion of the watershed to protect wildlife winter ranges. This area is of lower priority to agency land managers than winter range in the Mill and Willow creeks and German Gulch sub-watersheds.
52	Low	**Sand Creek:** Private land in-holdings in USFS land are at risk for development.	Acquire land or conservation easements. (USFS considers these areas to be low priority).
53	Low	**Sand Creek:** Surface water quality data for Sand Creek is lacking. Mine waste in rail beds adjacent to Sand Creek may be a source of metals contamination to Sand Creek and Silver Bow Creek. Bank erosion and road and rail disturbances along Sand Creek may be producing excess fine sediment that is ultimately delivered to Silver Bow Creek.	Investigate the presence and impacts from these potential sources. Take appropriate actions. See also deferred action #58.
54	Low	**Warm Springs Ponds:** Noxious weeds restrict growth of native vegetation. Wildlife habitat is also reduced. Historic smelter fallout may have rendered soils slightly phytotoxic, restricting plant growth.	Work with county and conservation officials to develop appropriate weed management strategies that takes into consideration findings of the Butte-Silver Bow soils survey. Take appropriate actions to improve upland vegetation.
55	Low	**Sand Creek:** Noxious weeds restrict growth of native vegetation.	Work with county and conservation officials to develop and implement appropriate weed management strategies that take into consideration findings of the Butte Silver Bow soils survey.
56	Low	**Warm Springs Ponds:** Access is restricted to private lands.	Pursue easement or other access possibilities such as Montana FWP block management as appropriate.

Summary of deferred restoration needs in the Silver Bow Creek watershed

Rank	*Issue/Problem*	*Planning Area and Restoration Needs*
Deferred (57)	**German Gulch:** Seepage from a waste rock dump at the Beal Mine has caused releases of selenium and other metals. Selenium levels found in fish tissue exceed aquatic toxicity levels and in down gradient waters exceed aquatic life standards.	Wait for outcome of pending remedial actions by the USFS and Montana DEQ to evaluate need for additional actions to reduce impacts from the seepage and address the future needed treatment of the leachate from the leach pad.
Deferred (58)	**Sand Creek:** Detailed nature and potential impacts of Rhodia phosphate facility are not fully known. The site is currently undergoing investigations and cleanup under an EPA order.	Wait for outcome of current investigations and cleanup of this site, which is to cover the entire site and any off-site releases. Evaluate following cleanup.
Deferred (59)	**Silver Bow Creek corridor:** Groundwater is contaminated beneath and to the north of the Warm Springs Ponds.	Under remedy, metals contamination from this source is being collected and pumped back to Pond 2 for treatment. The groundwater flowing from the system is expected to improve to the point that inception, pumping and treating will no longer be necessary in a few years to decades.
Deferred (60)	**Mill and Willow creeks:** Tailings from the 1908 flood of Silver Bow Creek have been deposited in the floodplain of Willow Creek.	This area is currently the subject of joint restoration and remedy planning and likely to be adequately addressed via that process.